



Jordan University of Science and Technology
Faculty of Agriculture
Nutrition & Food Technology Department

NF772 Dairy Technology

Second Semester 2019-2020

Course Catalog

3 Credit Hours. Basic and advanced thermal processing of milk, Fouling of equipment by deposit formation on walls as a result of heat treatment, application of membrane separation, hygiene by design, microbiological, chemical and physical contaminants, application and implementation of the seven HACCP system principles and its prerequisite programs GMP in dairies plant and automation in the dairy industry.

Text Book

Title	Dairy Microbiology Handbook
Author(s)	Robison, k. R. (2002)
Edition	3rd Edition
Short Name	1
Other Information	Edited by Richard K. Robinson, John Wiley and Sons, Inc., New York

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Advanced Dairy Science and Technology	Britz, J. T., Robison, k. R. (2008)	1st Edition	Blackwell Publishing Ltd, Australia
3	Advanced Dairy Chemistry, Volume 3: Lactose, Water, Salts and Minor Constituents	McSweeney, P. L. H., Fox, P. F. (2009)	3rd Edition	
4	Food Chemistry	Belitz, H.D., Grosch, W., Schieberle, P. (2009)	4th Edition	

Instructor

Name	Dr. Sana Gammoh
Office Location	C4 level 3

Office Hours	Sun : 14:30 - 16:00 Mon : 13:00 - 15:00 Tue : 13:00 - 14:00 Wed : 13:00 - 14:30
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Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 11:30 - 13:00 Room: U

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2, 3	1) Thermal Processing of Milk	
Weeks 4, 5, 6	2) Applications of Membrane Separation	
Weeks 7, 8, 9	3) Automation in the Dairy Industry	
Weeks 10, 11	4) SAFETY AND QUALITY OF DAIRY PRODUCTS	
Weeks 12, 13	APPLACATION OF PROCESS CONTROL MANAGEMENT TOOLS	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
1) Learn about the heat treatment, where a number of heat-induced transformations of milk components determine the functional properties of the final product such as biological safety, shelf-life, flavour, taste and texture. Fresh milk, cheese, milk powder and fermentation products such as yoghurt all require a different heat treatment, i.e. a specific temperature? time history	15%	
2) Learn about the fouling of equipment by deposit formation on walls as a result of heat treatment is governed by specific reactions of milk components. These typical undesired reactions reduce the heat transfer coefficient, increase the pressure drop over heat treatment equipment, and increase product losses, resulting in higher operating costs	10%	
3) Learn about the Reaction engineering approach applicable to the optimal design and operation of dairy heat-treatment equipment.	10%	
4) Learn about the impact of heating on the product properties, classification of the heat-induced (bio)-chemical reactions in milk, effect of the temperature-time history quantified, classification of heating processes and advanced heating systems such as Extended shelf-life (ESL) milk and innovative steam injection (ISI) approach.	10%	

5) Learn about the three classes of contamination represent hazards in milk, include biological hazards, such as bacteria, fungi and other microbial pathogens, chemical hazards such as residues of medication in the lactating animal, pesticides and a variety of industrial and environmental contaminants that might contaminate the feed of the lactating animal and finally land in the milk, and physical hazards such as discarded hypodermic needles, fragments of metal or glass and any other foreign object that may have found its way into the milk products, e.g. hair, feed particles, somatic cells, etc	15%	
6) Learn about the Application and implementation of the seven HACCP system principles and its prerequisite programs GMP in dairies plant and demonstrating this on ground in a dairy plant through answering a questionnaire concerning the implementation of HACCP system in food companies and accordingly submitting an evaluation report	15%	
7) Learn about the application of membrane separation in dairy industry by using the processes of Microfiltration and ultrafiltration, Reverse osmosis and nanofiltration, and Electrodialysis and electro-membrane filtration, and to learn about modules and modes of operation of pressure-driven membrane filtration processes and hygiene and cleaning practices	10%	
8) Learn about automation in the dairy industry; be aware about the factors driving automation, benefits, conceptual framework of an automated system, system and components and automation stages.	15%	

Relationship to Program Student Outcomes (Out of 100%)				
SLO1	SLO2	SLO3	SLO4	SLO5

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